

ABSTRACT

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This invention is a fail-safe algorithm for a hybrid electric vehicle (HEV). The method and system allow an HEV to continue to operate without damage after the engine cooling system is compromised, such as when there has been a total loss of engine coolant. Goals include a fail-safe vehicle strategy to maintain acceptable engine temperatures and minimal noise, vibration and harshness (NVH), while greatly extending the vehicle's operating range. First is a determination if the vehicle can rely on an electric traction motor's torque output to operate the vehicle. If engine operation is needed, engine fueling and firing of the cylinders is alternated to allow those cylinders to cool when no combustion is occurring. Engine speed is also optimized. NVH must remain within acceptable levels under most operating conditions. Further, the HEV parallel mode of operation (i.e., with a generator motor brake applied) is prohibited. And finally, the speed of at least one engine compartment cooling fan is optimized to minimize electrical load while maximizing airflow.